AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Previously Presented) A method for manufacturing a semiconductor device comprising:

(1) forming a semiconductor material layer on a substrate;

(2) irradiating at least a region of the semiconductor material layer with a continuous wave laser for heating and melting the semiconductor material in the region;

(3) promoting uniform cooling of the semiconductor material after irradiation; so that a polycrystalline microstructure is formed in the semiconductor material layer by lateral solidification from a boundary of the region;

further comprising forming a high thermal conductivity material layer between the semiconductor material layer and the substrate, the high thermal conductivity material having a thermal conductivity of at least 10 W/mK;

whereby a grain size of the polycrystalline microstructure is uniformly increased in length and width as the polycrystalline microstructure is formed in the semiconductor material layer by the lateral solidification from the boundary of the region.

2. (Previously Presented) A method for manufacturing a semiconductor device comprising:

(1) forming a semiconductor material layer on a substrate;

(2) irradiating at least a region of the semiconductor material layer with a continuous wave laser for heating and melting the semiconductor material in the region;

(3) heating the semiconductor material to a temperature in a range from 300 degrees Centigrade to a crystallization temperature of the semiconductor material; whereby after irradiation a polycrystalline microstructure is formed in the semiconductor material layer by lateral solidification from a boundary of the region;

further comprising forming a high thermal conductivity material layer between the semiconductor material layer and the substrate, the high thermal conductivity material having a thermal conductivity of at least 10 W/mK;

whereby a grain size of the polycrystalline microstructure is uniformly increased in length and width as the polycrystalline microstructure is formed in the semiconductor material layer by the lateral solidification from the boundary of the region.

3. (Previously Presented) A method for manufacturing a semiconductor device comprising:

(1) forming a semiconductor material layer on a substrate;

(2) irradiating at least a region of the semiconductor material layer with a continuous wave laser for heating and melting the semiconductor material in the region;

(3) providing a high thermal conductivity material layer in proximity to the semiconductor material layer, the high thermal conductivity material having a thermal conductivity of at least 10 W/mK , the high thermal conductivity material layer spreading heat in the region and promoting uniform cooling in the region;

whereby after irradiation a polycrystalline microstructure is formed in the semiconductor material layer by lateral solidification from a boundary of the region; and

whereby a grain size of the polycrystalline microstructure is uniformly increased in length and width as the polycrystalline microstructure is formed in the semiconductor material layer by the lateral solidification from the boundary of the region.

4. (Original) The method of claims 1, 2, or 3, wherein the semiconductor material layer is a silicon film.

5. (Previously Presented) The method of claims 1, 2, or 3, further comprising directing a beam from the laser through a mask slit and onto the semiconductor material layer wherein the laser irradiation is performed sequentially with respect to an adjacent region or a partially overlapping region of the semiconductor material layer by adjusting a relative position of the semiconductor material layer and the mask slit.

6. (Cancelled)

7. (Original) The method of claims 1 or 3, further comprising heating the semiconductor material to a temperature in a range from 300 degrees Centigrade to a crystallization temperature of the semiconductor material.

8. (Original) The method of claims 1, 2 or 3, wherein a second laser beam is employed to heat the semiconductor material to a temperature in a range from 300 degrees Centigrade to a crystallization temperature of the semiconductor material.

9. (Original) The method of claim 8, wherein the second laser beam has a wavelength of the visible region to the infrared region.

10. (CANCELLED)

11. (Currently Amended) The method of claim ~~10~~3, further comprising forming a low thermal conductivity material layer between the high thermal conductivity material layer and the semiconductor material layer.

12. (Currently Amended) The method of claim ~~10~~3, wherein the high thermal conductivity material is one of aluminum nitride; silicon nitride; a mixture of aluminum nitride and silicon nitride; magnesium oxide; cerium oxide; titanium nitride.

13. (CANCELLED)

14. (Original) The method of claims 1, 2, or 3, further comprising forming a cap layer having a film thickness of the range which prevents reflection with respect to the wavelength of the laser beam on the semiconductor film.

15. (Original) The method of claims 1, 2, or 3, further comprising applying a magnetic field perpendicular to a surface of the semiconductor material layer.

16. (Original) The method of claims 1, 2, or 3, further comprising creating an electromotive force by application of a magnetic field perpendicular to a surface of the semiconductor material layer, application of the magnetic field and movement of melted silicon, the electromotive force serving to lengthen and widen lateral growth crystals in the polycrystalline microstructure.

17. (Original) The method of claims 1, 2, or 3, further comprising application of a magnetic field perpendicular to a surface of the semiconductor material layer, and directing a beam from the laser through a mask slit and through the magnetic field onto the semiconductor material layer.

18. (Original) The method of claims 1, 2, or 3, further comprising application of a magnetic field perpendicular to a surface of the semiconductor material layer, and using a magnet in a sample stage to apply the magnetic field.

19. (Original) The method of claims 1, 2, or 3, further comprising performing step (2) for adjacent or at least partially overlapping regions of the semiconductor device.

20. (CANCELLED)

21. (Withdrawn) A semiconductor device comprising:
a semiconductor material layer formed on a substrate, the semiconductor material layer having a polycrystalline microstructure formed by lateral solidification from a boundary of a region irradiated with laser after melting using laser irradiation;
a high thermal conductivity material layer in proximity to the semiconductor material layer which served for spreading heat in and promoting uniform cooling in the region after the irradiation.

22. (Withdrawn) The device of claim 21, wherein the high thermal conductivity material layer is between the semiconductor material layer and the substrate.

23. (Withdrawn) The device of claim 22, further comprising a low thermal conductivity material layer between the high thermal conductivity material layer and the semiconductor material layer.

24. (Withdrawn) The device of claim 21, wherein the high thermal conductivity material has a thermal conductivity of at least 10 W/mK.

25. (Withdrawn) The device of claim 21, wherein the high thermal conductivity material is one of aluminum nitride; silicon nitride; a mixture of aluminum nitride and silicon nitride; magnesium oxide; cerium oxide; titanium nitride.

26. (Withdrawn) A semiconductor device produced by the process of claims 1, 2, or 3.

27. (CANCELLED)